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Autumn Colors. This is one of the most interesting times of the year to visit the Arboretum which is gay now with the autumn colors of many leaves. Those of a few plants have already turned and begun to fall, and others are practically as green as they were in summer. The most brilliant color made in the early autumn is by the native Red Maple, the Ampelopsis or Virginia Creeper, and *Phellodendron amurense*. This last is a small tree from the Amoor region of eastern Siberia and is chiefly interesting as the type of a small genus with a few species of trees of eastern Asia of the Rue Family, and for its peculiar thick, ridged, pale, cork-like bark. Early in October the leaves turn to a bright clear yellow which is hardly equalled in beauty by the yellow autumn leaves of any other tree. This beauty is short-lived and the branches are already bare. This is perhaps one of the rarest trees in the Arboretum and certainly the rarest of the five species which are now well established here. *Phellodendron japonicum* appears to have been raised first in the United States in the Botanic Garden at Cambridge, and the male and female plants were moved from there to the Bussey Institution in its very early days and are still flourishing and producing their fruit annually. Two plants of *Phellodendron amurense* came a little later direct to the Arboretum from the Imperial Botanic Garden at St. Petersburg in small pots and unfortunately are both of one sex and have never produced flowers.

The *Sassafras* is just now, too, one of the most beautiful trees in New England woods and by roadsides as the leaves have turned or are turning orange or yellow more or less tinged with red. The

autumn colors of several trees are perhaps more brilliant but none of them equal the Sassafras in the warmth and delicacy of their autumn foliage. The Sassafras is also a handsome tree at other seasons of the year. In the winter it is conspicuous for its dark cinnamon gray bark and slender light green branchlets; in early spring before the leaves appear it is covered with innumerable clusters of small light yellow flowers which make it at that time a conspicuous and beautiful object. The leaves are thick and green, lustrous above, paler below, and very remarkable in shape as they are sometimes deeply lobed at the apex and sometimes entire without a trace of lobes. The fruit is bright blue surrounded at the base by the much enlarged and thickened small calyx of the flower, and is raised on a bright long red stalk. No other North American tree produces such brilliantly colored fruits. Unfortunately there is little time to enjoy it for the birds greedily seek it as soon as it ripens. The wood of the Sassafras is not attacked by borers, and the leaves are not destroyed or rarely disfigured by insects. The thick spongy roots of this tree produce suckers freely and these with a little care should be safely transplanted. How many persons now plant the Sassafras, and in how many American nurseries can it be found? It was, however, one of the first North American trees carried to Europe, as it was established in England sometime before the middle of the seventeenth century. Until 1879, when another species was discovered in central China, the American tree was believed to be the only Sassafras. The Chinese tree has unfortunately not yet proved hardy in New England. The American species does not always prove as easy to transplant as it might, and in the Arboretum it has proved extremely difficult to multiply as much as has been desired.

The color of the leaves of a group of dwarf Hawthorns is not surpassed in beauty from the middle to the end of October. These plants are referred to the Intricatae Group and are arranged together on the lower side of the road at the eastern base of Peter's Hill next to the Crabapple Collection. These shrubs are confined to the northern United States and Canada, and are perhaps more numerous in Pennsylvania, western New York and Michigan than in any other part of the country. Their flowers are large and conspicuous with yellow, rose-colored or pink anthers, and the fruit ripens late and is scarlet, red, orange-yellow or russet, and its beauty is increased by the brilliantly colored leaves at the time it ripens. A large number of these plants are now in the collection, and one of the handsomest this year is *Crataegus cuprea* with scarlet foliage and russet or copper-colored fruit. This little shrub was first detected in a small lot in the city of Wilmington, Delaware, and is not known to grow naturally beyond the limits of that city. *Crataegus Delosii*, found growing several years ago by the side of a road near Toronto, is unusually full of its orange and red fruits this autumn. This species differs from the others of the group in the large number of fruits (ten to fifteen) compactly arranged in dense clusters. The autumn leaves are green and yellow. Other species of this group deserving of attention are *C. infera* from the neighborhood of Sellersville, Bucks County, Pennsylvania, with orange-red fruit and brilliant orange and red autumn leaves; *C. fruticosa*, shrub five or six feet tall, which has only been found on the Serpentine Ridge near West Chester, Pennsylvania, with deep, orange-red

fruit in small erect clusters, and dark red-purple autumn leaves; and *C. modesta*, a shrub not often more than twelve or eighteen inches high, first noticed on a hill near Rutland, Vermont, but now known to grow in many places in southern New England and to range into eastern Pennsylvania, and conspicuous in the autumn with its bright scarlet leaves and green, yellow or orange and red fruits. Two of the southern Appalachian species, *C. Buckleyi* and *C. Boyntonii*, are small trees rather than shrubs and in the Arboretum have grown into pyramids now ten or twelve feet tall and are still covered with dark green leaves which later turn to shades of orange and scarlet.

As a general rule the bright colors appear earlier in the autumn on eastern American than on allied Asiatic species, but there are a few conspicuous exceptions to this rule; and in addition to the *Rhododendron* during the last week or ten days *Acer ginnala*, *Evonymus alatus* and *Rhododendron* (*Azalea*) *japonicum* have perhaps been the most brilliant plants in the Arboretum. The Maple is a small shrubby tree sometimes thirty or forty feet high, with pointed deeply divided leaves, and compact clusters of fragrant flowers. A native of eastern Siberia, where it is common in the neighborhood of Vladivostok, it was one of the first plants introduced into the Arboretum whence it came from St. Petersburg. No American tree assumes more brilliant tones, but the brilliancy lasts only for a few days and the leaves fall early. *Evonymus alatus* from Japan is without a rival in the brilliancy of the deep rose color passing to scarlet of its autumn leaves. The habit of this shrub is excellent when it has an opportunity to spread out in the sun but the flowers and fruit are inconspicuous. The value of the Burning Bush as a decorative plant is now appreciated and it is found in many American nurseries, but it must not be forgotten that it requires a large space in which to develop its greatest beauty. A form of this shrub raised from seeds collected in Korea by Mr. Jack with its larger fruit and even more brilliant autumn foliage is handsomer even than the Japanese form. In their autumn color of old gold the leaves of *Rhododendron japonicum* are more beautiful than those of any others in the collection, and its autumn color greatly adds to the ornamental value of this shrub which when in flower is the handsomest of the Asiatic Azaleas which are hardy in this climate, with the exception of the Korean *Rhododendron Schlippenbachii*.

Sorbus alnifolia of the section *Micromeles* of the genus is perhaps the most satisfactory of the Mountain Ashes with entire leaves which can be grown here. It is a common Japanese tree and occurs also in Korea, in northern and central China, and sometimes in its native country grows to a height of sixty feet. Several specimens have been growing in the Arboretum since 1893 and are now from twenty to thirty feet tall. These trees are pyramidal in habit with pale smooth stems, upright branches which form a broad, compact, symmetrical head, and dark green leaves three or four inches long, small white flowers in from six- to twelve-flowered clusters, and abundant lustrous scarlet or orange-colored fruit which remains on the branches after the leaves and until eaten by birds which are fond of the fruit of all the species of *Sorbus*. The leaves turn bright clear yellow about the middle of October and soon fall. Mountain Ashes thrive only in well-drained rich soil and

suffer from drought and insufficient nourishment. They are particularly liable to attacks of the San José scale, and in order to secure healthy plants it is important to spray them late in March or early in April with lime-sulphur.

Viburnum prunifolium, often called Black Haw, is perhaps one of the handsomest of the small trees or large shrubs in the Arboretum with scarlet or purple leaves which are just turning. A common plant on hillsides in the middle Atlantic states the Black Haw, although not a native of Massachusetts, is hardy here and well deserves cultivation for it is an object of interest from early spring until the beginning of winter. The leaves are thick, coriaceous, dark green and lustrous above and pale below. The flowers are white, in slightly convex clusters, and these are followed by fruit pink at first when fully grown, becoming dark blue and covered with a glaucous bloom when ripe and persistent on the branches until winter. A southern representative of this plant with which it was long confounded is now called *Viburnum rufidulum* and is a larger and handsomer tree with thicker and more lustrous leaves which turn deep purple in the autumn. This tree, which under favorable circumstances becomes the largest and is perhaps the handsomest of all American Viburnums, is easily recognized by the large russet brown felt which covers the winter-buds. *V. rufidulum* grows in the Arboretum where it flowers and ripens its fruit, but it is doubtful if it ever becomes more than a medium-sized shrub here.

The leaves in autumn of some of the American Azaleas are almost as brilliant as those of *Rhododendron japonicum*. Perhaps the most brilliant of these is the late-blooming, yellow or flame-colored *Rhododendron calendulaceum* which equals some of the other shrubs of the family which are unsurpassed in beauty during several months. None is more beautiful in the autumn than the crimson or purple of the leaves of the Highbush Blueberry so-called, *Vaccinium corymbosum*. This plant is handsome, too, in early spring when its white bell-shaped flowers open, and in August or September when the blue-black fruit covers the branches. A native of swamps, the Highbush Blueberry grows equally well in dry gravelly ground, and the best plants in the Arboretum are on Bussey Hill near the entrance to Azalea Path and opposite the overlook. The autumn color of the other northern Blueberries and Huckleberries is as brilliant as that of the Highbush Blueberry and some of them, especially *Vaccinium pennsylvanicum*, are invaluable for covering dry ground under Oaks and other hardwood trees. The white flowers are attractive; the bluish black berries, which are the earliest Blueberries to ripen, have a fair flavor and during a month or more in autumn the plants form broad masses of scarlet only a few inches high and more brilliant in color than the flowers of the Heather on the Highlands of Scotland. Every encouragement with good results has been given in the Arboretum to the spreading of these Blueberries.